HEAVY ENGINEERING BUSINESS

Coke Drums for Marathon Petroleum Corporation, USA

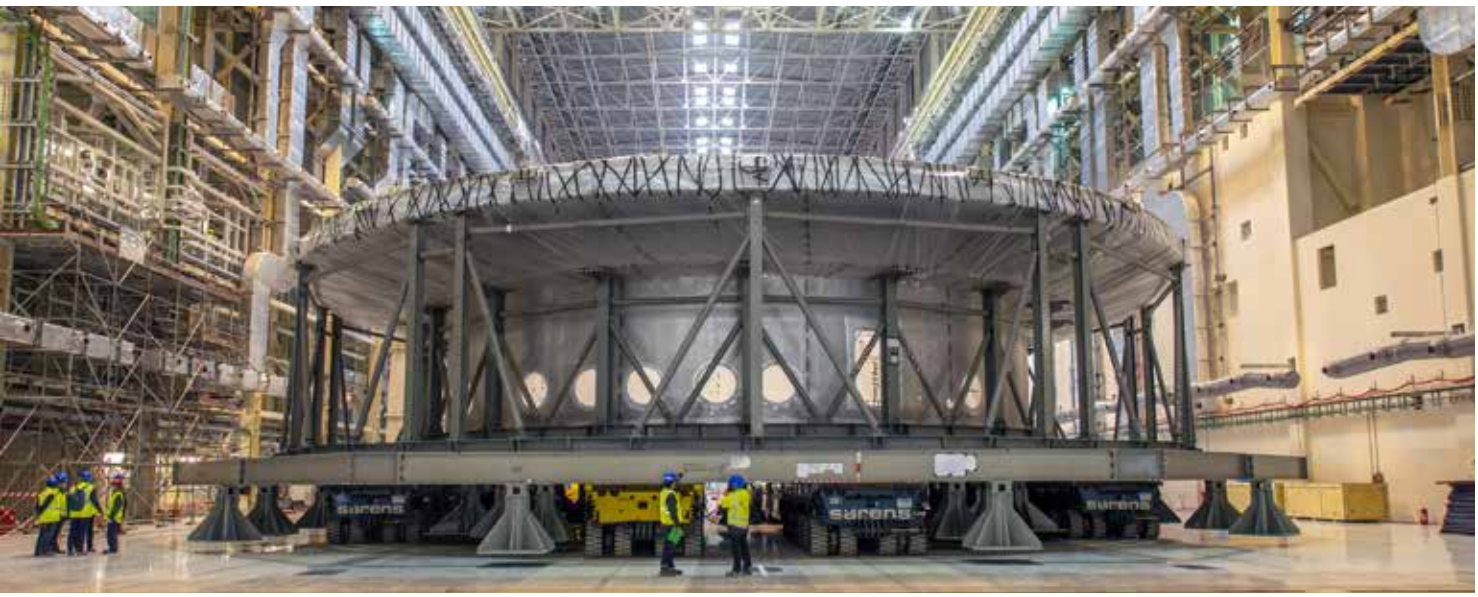
Overview:

L&T Heavy Engineering (HE) is amongst the top 3 global fabricators to supply engineered-to-order critical equipment, piping and systems for core sector industries – Refinery, Petrochemical, Oil & Gas, Gasification, Fertilizer, Thermal & Nuclear Power including critical revamp and up-gradation projects.

The business is organized into Business Units (BUs) based on the industries served. The Refinery, Cracker, Oil & Gas and Gasification BU **(RCOG)** focuses on hydro-processing reactors, high-pressure heat exchangers, gasifiers, pressure vessels, waste heat boiler packages, process plant internals and such critical equipment for process plants. The Fertilizer and Petrochemical BU **(FP)** focuses on products like ammonia converters, urea reactors, urea strippers, methanol converters and critical reactors for the fertilizer and petrochemical sector. The **Nuclear** BU supplies highly critical equipment like steam generators, reactor components (end shield assembly, end fittings) and pressurizers for the nuclear power sector. The Modification, Revamp & Upgrade **(MRU)** unit offers complete solutions for Process Plants through dedicated engineering, procurement, project management and construction services. The Piping Center **(LTPC)** fabricates critical piping spools for power and other process industries.

The business has a JV with Nuclear Power Corporation of India (NPCIL) i.e., L&T Special Steels and Heavy Forgings Private Limited (LTSSHF), to cater to the demand for critical forgings required for the Indian Nuclear Power programme and for other critical sectors like Defence, Hydrocarbon and Oil & Gas. The JV has set up a fully-integrated forging facility (from steel scrap to finished forgings of alloy steels, carbon steel & stainless steels) with capacity to produce a single-piece ingot up to 200 MT and forgings up to 120 MT in the first phase. These have applications in critical equipment in Nuclear power plants, Defence, the Hydrocarbon industry and the Power sector. Other applications include separator blocks for the Oil & Gas segment and other heavy forgings for engineering applications.

The business has achieved international recognition through an impeccable track record of executing large, complex projects and constantly creating international benchmarks. Capabilities include state-of-the-art fully integrated, globally benchmarked manufacturing facilities, an experienced talent pool and impressive global references for the supply of high-end reactors and high-pressure heat exchangers. The sustainability and safety standards at its manufacturing facilities located in Mumbai, Hazira and Vadodara are at par with international standards.



Cryostat Base Section for ITER, France

Business Environment

The business faced fierce competition from European, Korean and domestic fabricators, while Korean, Chinese and European companies continued to get preference due to ECA (Export Credit Agency) financing requirements. Excess global capacities and limited demand put pressure on pricing and deliveries.

Amidst stiff competition, the business continued to bag significant orders from global and domestic clients for hydrocracker reactors, ethylene oxide reactors, coke drums, HP heat exchanger and heavy columns, mainly for projects in Middle East, South East Asia, North America and Mexico. In the domestic market, the business bagged orders for high pressure & exotic material heat exchangers for HPCL's RUF Project and an ethylene oxide reactor for IOCL's Paradip Project.

The domestic Nuclear sector continued to remain sluggish due to delay in fleet procurement orders.

Major Achievements

In the domestic market, the business has secured the order for the first Coal Gasifier using Air Product Technology solutions for the Talcher Gasification Project. During the year, the country's heaviest hydrocracker reactor weighing 1858 MT was dispatched to HPCL's Vizag Refinery.

On the international front, the business dispatched 16 critical Chrome-Moly-Vanadium reactors for ADNOC-Takreer refinery, Abu Dhabi – all delivered before time. The MRU business vertical executed a benchmark project – revamp of an FCCU reactor for the ORPIC Refinery in Oman.

On the Nuclear front, the base section and upper cylinder of the Cryostat, a key component of the world's largest fusion reactor, was delivered to ITER at Cadarache, France. Cycle time for NPCIL's 700 MWe Steam Generator, currently under manufacturing, was reduced from contractual 48 months to a record 30 months, setting an industrial benchmark.

In the Defence sector, LTSSHF has been qualified as the only indigenous producer of large and heavy forgings and thick plates for the prestigious Submarine Programme.

Significant Initiatives

L&T Heavy Engineering embarked on a journey to be the best manufacturer of critical fabricated equipment in the world, determined to 'Transform for Future NOW!' to improve competitiveness and deal with the challenging market scenario. In 2019-20, the business focused on cultural transformation, specifically streamlining initiatives across the units and aligning with the Mission Statement. The Root Cause Analysis (RCA) system was strengthened to

India's heaviest Hydrocracking Reactor (1858 MT) for HPCL Visakh Refinery

expand beyond quality and safety to cover project cost and other overruns.

Environment, Health and Safety

The business conducted awareness sessions through the celebration of National Safety Day, Road Safety Week and World Environment Day at the workplace as well as in Surat City. During the year, 48 batches of safety training programmes were conducted at the Safety Innovation School, Hazira for neighbouring industries. As a part of the safe workplace initiative, oxygen sensors were installed at confined locations and various initiatives were undertaken for treatment of emissions, effluents, industrial gases/wastes. The business has adopted ISO 45001:2018 standard from the earlier OHSAS 18001. The business won the 'Platinum category Energy & Environment Global Safety Award 2020' at the 10th World Petro Coal Congress 2020.

Human Resources

The business continued to improve its Performance Management System from SMART (Specific, Measurable, Attainable, Relevant and Time-based) goal-setting to meaningful performance dialogue and subsequent fair performance evaluation. Special programmes were designed with help from internal and external faculty for staff and workmen. These programmes focus on driving the culture of Safety, Quality and Productivity and emphasize upon Transparency, Trust, Action-orientation and Teamwork.

Employee Engagement was a thrust area for FY20 with the introduction of the 'Josh Brigade' – teams of Employee Engagement Champions who drive initiatives at the department level. The Mentorship initiative was extended to promising young managers. Critical role-holders were identified, and succession planning is in progress for a sustainable leadership pipeline.

Risks and Concerns

The business faces the risk of reduced investments in the refinery sector due to falling crude prices. To mitigate the same, it has expanded its MRU offering, which continues to grow due to focus on upgrades, modernization and revamps of existing plants.

Shrinking markets and increasing competition, on both the International and domestic fronts, continues to be a challenge. To sharpen the competitive advantage of engineering strength, the business has identified the role of CTO (Chief Technology Officer) as being exclusively responsible to build and develop engineering and technological capabilities and knowledge management within the Company.

Capabilities have been developed for niche equipment for specialty chemicals and petrochemicals like Purified

Forging of Nuclear Component at L&T Special Steels and Heavy Forgings

Terephthalic Acid (PTA) and Acrylic acid. The business is also expanding into new geographies like North Africa, Egypt, Mexico and MRU offerings for the Middle East and Asia Pacific region. To mitigate the risk of doing business in new geographies, the business avails of export credit insurance to secure credit risk.

The business faces foreign competition in domestic projects. To have a level playing field, it is proactively suggesting policy changes to the ministries through industry associates. Anomalies in implementation of Make-in-India and GST by Public Sector Units (PSUs) procurement are being addressed.

On the supply chain front, competitive sourcing remains a focus area. With increasing price pressure, the business has identified and developed new vendors in China, Eastern Europe and India. The direct impact of COVID-19 on orders under execution is covered under the force majeure clause of the contract on account of expected delay.

Outlook

The global pandemic of COVID-19, combined with global recession and a tough business environment, may lead to reduced demand for heavy engineering equipment in the short term. However, with a global recovery expected towards the end of FY 2020-21, we expect the crude prices to improve, which may lead to revival of the capital expenditure cycle.

Nuclear customers are increasingly adopting strategies like reverse auction and qualifying new suppliers. This is resulting in a huge supply-demand gap with less demand and excess global capacity, and thus causing increased pressure on price and margin.

For the ongoing domestic bids, we expect slow progress in project finalization on account of the COVID-19 pandemic. In the domestic market, we expect new projects in the sectors of Coal to Chemicals, Petrochemical and the Specialty Chemicals industry, and increased demand for MRU services. Nuclear fleet procurement opportunities (700 MWe PHWR projects) are expected to be tendered in FY 2021.

For the LTSSHF business, the domestic sectors in the fields of nuclear and defence are expected to grow in the coming years. The Government has cleared the proposal of investment in 10 domestic nuclear power plant (700 MWe each) through bulk ordering. This has opened up opportunities for the JV with the placement of orders for supply of Steam Generator forgings for 6 units, End Shield Plates for 4 units and forgings for Pressurizer and Bleed Cooler for 4 units.